DOCUMENT RESUME

ED 306 589 CS 211 839

AUTHOR Kelly, Leonard P.; Kerst, Stephen
TITLE The Interference of Meaning in Error Detection during Editing.
PUB DATE Mar 89
NOTE 19p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, March 27-31, 1989.)
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Freshmen; Comparative Analysis; Deafness; *Editing; Epistemology; Higher Education; Memory; *Writing Processes; Writing Research
IDENTIFIERS Communicative Approach; *Error Detection; Text Factors

ABSTRACT

In order to examine the differential availability of attention between the self-written text and standard text conditions, changes in error detection performance of unskilled hearing writers were compared with those of profoundly deaf writers. Subjects, 10 profoundly, pre-lingually deaf college freshmen with no additional handicaps and a comparison group of 5 hearing freshmen, produced separate written accounts of two short stories that they viewed on videotape. Subjects then reviewed and revised their original drafts and later reviewed and revised a passage with standard content after representative errors had been embedded in the passage. Generally, the deaf writers were less successful than the hearing subjects at correcting errors in their own compositions, and both groups of subjects were more successful correcting the errors in the standard passage than in those that they had written themselves. Results indicated that even during a dedicated error search, the language constraint faces considerable competition for the writer's attention--the working memory always encounters potential invasion by the meaning of the text. Findings also (1) showed that the process of writing about a certain topic promotes the retrievability of that information--its ease of returning to working memory with a minimum of prompting; and (2) suggest that explicit knowledge of grammar conventions is not completely at a writer's disposal during composing and editing. (One table of data is included, and 17 references and one appendix showing an application of the Crandall scoring system are attached.) (MS)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

ED306589

# The Interference of Meaning in Error Detection During Editing

by

Leonard P. Kelly, Ph.D.
Research Scientist
Gallaudet University
Washington, D.C.

Stephen Kerst, Ph.D.
Associate Professor
The Catholic University of America
Washington, D.C.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Leonard Kelly

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Paper presented at the annual meeting of The American Educational Research Association, San Francisco, March, 1989

CS211839

## Introduction

Although few are puzzled by the finding that writers are more adept at detecting errors in standard experimental texts than in their own compositions, explanations for the discrepancy are neither unanimous nor conclusive. Hull (1987) reasoned that the novelty of the errors in standard texts produces greater detectability. Writers simply do not make certain kinds of errors when they write, and thus these errors stand out more during inspection of a standard text. As an additional explanation, Bartlett (1982) and Hull (1987) point to the possibility that writers' prior intentions for their texts--their "privileged information"--tends to mask certain kinds of flaws such as referential ambiguities. Inexperienced writers in particular sometimes don't realize that their audiences require more explicit links between pronouns and their antecedents.

Both of these explanations emphasize characteristics of certain errors, which make them less detectable. Less emphasis, however, is placed on a qualitative difference between the two textual environments in which the error search takes place. During revising of our own writing there may be less attention available for error detection. This poses an additional explanation for the relative ease of finding errors in a standard text and provides insight into the nature of obstacles to writers' thorough editing of their own texts. Here it is proposed that it may be more difficult to focus attention searching for our own errors because the meaning of our texts, systematically stored in LTM during composition of the first draft, constitutes such a strong competitor for Working Memory.

The differential availability of attention between the self written and standard text conditions was examined in the present study by comparing changes in error detection performance of unskilled hearing writers with those of profoundly deaf writers. There are reasons to believe that deaf writers are relatively more reliant on explicit "learned" language competence, which in contrast to intuitive "acquired" competence, requires attention for its use. The error detection performance of deaf writers ought to improve more than that of hearing writers when composing conditions provide greater availability of attention for error detection. Because hearing writers are less reliant on learned language competence to detect errors, they would tend to benefit less from more plentiful attention. Thus, relatively superior error detection in standard vs. self-written passages by the deaf writers would suggest that more attention is available under the standard text condition when intended meaning competes less for Working Memory. Under those conditions, deaf writers can capitalize on this more available attention in order to apply their learned language competence.

## Theoretical Framework

Cognition and Composing. Two recent applications of cognitive theory to composing have relevance to this study. First, researchers such as Flower and Hayes (1980) and Scardamalia (1981) have reminded us of how difficult the writing process is because of human limitations in Working Memory, another name for our attention. We have learned that writing requires the mangagement of multiple constraints, parsimoniously summarized by Flower and Hayes as Knowledge, Language, and Rhetoric. Yet the limited

capacities of our Working Memories prevent us from attending to more than one constraint at the same time. Excessive attention to one constraint necessarily limits attention to the others. So, if a writer remains focused on meaning--the Knowledge constraint--then Language may suffer.

A second link between cognition and composing is the research that shows the connection between writing and learning. Langer and Applebee (1986) and Newell (1985) produced findings to indicate that the process of writing about information, in contrast to more passive forms of learning such as listening to a lecture or reading, tends to store the information in Long Term Memory in a more effective fashion, as indicated by its enhanced retrievability at later times. We can reason that systematic storage of information through writing may work in two ways to jeopardize detection of errors in passages that we have written ourselves. First, as we are reading our own texts, the meaning stored earlier is quickly retrieved from Long Term Memory, takes up residence in Working Memory, and thus captures the sustained attention originally intended for the error search. Second, because the information is so well known, writers-as-readers need minimal graphic information in order to resolve meaning uncertainties. They are thus prone to giving only superficial scrutiny to the text's surface correctness.

In contrast, the information of a standard passage written by an experimenter is not already stored in Long Term Memory. Reading of a standard text does not, therefore, stimulate retrieval of a vivid mental representation of text that would tend to capture Working Memory and reduce the attention available for the search for errors. The effect of meaning

capturing attention should be particularly dramatic on the error detection of writers whose error detection processes rely on the availability of attention, as may be the case with deaf writers.

Acquired vs. Learned Language Competence. There are good reasons to believe that compared to native speakers of English who have normal hearing, deaf writers tend to rely more on learned language competence rather than acquired competence. According to Krashen (1978), acquired competence is the intuitive, fluent knowledge that the language user "picks up" primarily through immersion in naturally occurring communication events. In contrast, Learned competence is the language user's explicit knowledge of the conventions of a language, resulting typically from instruction in the rules of grammar and explicit correction of errors, the kind of experience customarily provided in a formal class setting. Importantly, use of learned competence requires the use of attention while acquired competence functions with relative automaticity.

The literature on deafness gives a variety of reasons to believe that the deaf are relatively more reliant on explicit learned competence in English: 1) They are virtually insulated from the sound of the language, the medium through which it is initially acquired by native speakers (Crandall, 1978); 2) Prevalent tactics for teaching English to the deaf have placed great emphasis on application of explicit rules to individual sentences (Meath-Lang, 1982; Wilbur, 1977); and 3) Charrow (1974) and others maintain that many deaf writers produce written language according to a non-standard code, a tendency that logically would be offset only by an intentional application of explicit language knowledge. The greater

reliance of the deaf on the kind of language competence that requires attention in order to function completes what amounts to a natural experiment for testing the theory that writers detect fewer errors in their own texts because their attention is circumscribed by their well learned meaning.

Hypotheses

Correction of errors in self-written text (Revising Self) is compared to correction of errors in a standard experimental text (Revising Other). If the superiority of Revising Other performance over Revising Self is greater for the deaf writers than for hearing writers, it would suggest that attention is more available under the Revising Other condition, when the meaning of text is less competitive for attention.

Methods

Subjects. Ten deaf subjects were profoundly, pre-lingually deaf college freshmen with no additional handicaps. They all had hearing parents. The comparison group of five hearing subjects were between 18 and 21 years old and attending their first year of college. They were native speakers of English and, like the deaf subjects, their prior writing samples contained errors from selected categories in the classification system (Crandall, 1980) used in the study. Appendix A gives examples of the error categories.

Data Collection. In the initial stage of data gathering, Generating subjects produced separate written accounts of two short stories that they viewed on videotape. The stories were signed and spoken on the tapes so that they were understandable both to hearing and deaf subjects.

In the next phase, Revising Self, subjects reviewed and revised their original drafts during sessions that occurred a number of days after Generating. Subjects were instructed to inspect their texts and make changes that they thought would improve the grammar of their original versions. They recopied the sentences of the original compositions after they had separately inspected them and decided on any necessary changes. Subjects were discouraged from adding new story information to their original texts.

Finally subjects processed text under a third condition, Revising Other, when they reviewed and revised a passage with standard content after representative errors had been imbedded in the passage. To produce these common passages, the investigator composed an account of one of the videotape stories that the subjects had written about during the earlier sessions. Then a common set of errors (modeled after the examples of deaf students' errors that appear in Crandall's manual for classifying errors) were imbedded in the 554-word text. Subjects reviewed and revised the passage, presented to them as "another student's" composition.

Data Analysis. All errors in subject drafts were classified according to the levels in Crandall's system, ranging from the least severe Type 9, Mechanical errors to Type 4, Structural Errors (Error Types 3, 2, and 1 essentially indicate multiple Structural Errors). The percentage of errors corrected in each category was tabulated for each subject under both editing conditions. Two indices of changes in performance between Revising Self and Revising Other were also calculated: Actual Change was calculated by subtracting the Revising Self correction rate from the Revising Other

correction rate; Proportionate Change was obtained for each subject by dividing Actual Change by the correction rate during Revising Self. The Proportionate Change indicates the significance of Actual Change for a particular subject.

Results

Average error densities, correction rates, and changes between conditions are displayed in Table 1 on the following page. Before examining the data that respond to the central research question, it is helpful to first understand the severity of the grammatical problems of these two groups of writers. The data in column B show that, except in the Type 9 error category, the deaf writers were less successful than the hearing subjects at correcting errors in their own compositions. The deaf writers were least successful in finding Type 5 errors, which include wrong choice of content words and pronoun reference problems; the deaf group corrected 13 percent of these errors. Recall that Bartlett (1982) has emphasized the elusiveness of pronoun reference errors. They were most successful in correcting structural errors. In this category they corrected 39 percent.

Considering the density of errors that were left uncorrected, it appears that Type 6 and Type 8 errors constituted the sources of the most serious discrepancies between hearing and deaf writers. Of the Type 8 errors present in their original texts, the deaf writers corrected only 21 percent, leaving an average of 4.8 Type 8 errors per 100 words. The deaf writers failed to correct almost as many Type 8 errors per 100 words as the hearing writers had produced in their original texts. The hearing writers, in contrast, corrected 37 percent of these errors, a rate almost twice that

Table 1

Mean Error Densities, Correction Rates, and Inter-Condition Changes for Self Written and Standard Texts

| | | Self Written | | Standard | | Change | |
|---|---|---|---|---|---|---|---|
| | | A. | B. | C. | D. | E. | F. |
| Category | Group | Errors Per 100 Words | Percent Corrected | Errors Per 100 Words | Percent Corrected | Actual | Proportionate |
| Type 9: Punctuation | Deaf | 2.0 | 18% | .5 | 73% | 55% | 470% |
| | Hearing | 3.4 | 15% | .5 | 73% | 59% | 380% |
| Type 8: Inflectional Morpheme | Deaf | 6.0 | 21% | 4.9 | 65% | 44% | 217% |
| | Hearing | 4.9 | 37% | 4.9 | 61% | 24% | 88% |
| Type 6: Free Functor | Deaf | 5.0 | 17% | 3.3 | 48% | 31% | 240% |
| | Hearing | 3.2 | 35% | 3.3 | 55% | 20% | 65% |
| Type 5: Semantic Contentive Stem | Deaf | 1.6 | 13% | 1.8 | 42% | 29% | 267% |
| | Hearing | 1.0 | 20% | 1.8 | 60% | 40% | 300% |
| Type 4*: Structural | Deaf | .8 | 39% | 1.8 | 70% | 31% | 65% |
| | Hearing | 1.7 | 80% | 1.8 | 75% | -4% | -5% |

* Error Types 3, 2, and 1 indicate multiple Type 4 errors.

of the deaf writers. This meant that their revised texts contained an average of 3.1 Type 8 errors per 100 words. Through the revision process the hearing writers seemed to increase their superiority over the deaf group in this error category.

In the Type 6 category, which was also a frequent classification for many of the errors made by both groups of writers, the hearing subjects were more than twice as successful at finding and correcting the errors that they had committed during the Generating condition. They corrected 35 percent of these errors, reducing their average error rate to just over two Type 6 errors per 100 words. The deaf writers were far less successful, correcting only 17 percent of these kinds of errors. At the conclusion of the Revising Self condition, they had preserved an average of more than four Type 6 errors per 100 words, an error rate almost twice that of the hearing writers. In this second category of frequent errors, which contain many of the errors that are most persistent in the writing of the deaf, the hearing writers were asserting a greater superiority.

The data in column D show, consistent with the findings of Bartlett (1982) and Hull (1984), that both groups of subjects were far more successful correcting the errors in the standard passage than in those that they had written themselves. The deaf and hearing writers had similar correction rates while editing under this condition. The only noticeable difference was in Type 5 errors in which the deaf corrected 42 percent of the errors compared to a 60 percent correction rate for the hearing writers. The other categories were approximately equal. Related to Type 8 errors, a category in which the hearing writers had exhibited a marked superiority

under the earlier composing conditions, the deaf writers actually surpassed the correction rate of the hearing group, 65% to 61%.

The data of columns E and F respond more directly to the research question posed by this paper. Recall that a larger change by the deaf writers would suggest that their attention had been relatively more available under the Revising Other condition, allowing them to more easily use their attention-dependent error correction strategies. Considering the changes across all error categories, it appears that the deaf subjects demonstrated improvements that far surpassed those of the hearing group. Particularly significant were their superior improvements in error Type 6, Free Functor errors, which improved 240% for the deaf subjects compared to 65% for the hearing subjects, and in Type 8, Inflectional Morpheme errors, an improvemenet of 217% for the deaf compared to 88% for the hearing writers. The superiority of the deaf writers in these two particular categories is especially important because they contained the greatest frequencies of errors. In other words, they contain most of the errors that remain undetected when writers are inspecting their own texts. It should be noted that the hearing group did improve somewhat more in the Type 5 category, but the Actual and Proportionate gains of the deaf writers were also dramatic.

The superior improvement of the deaf subjects supports a conclusion that there is less competition for attention under the Revising Other condition. The Revising Other condition was more conducive to application of explicit knowledge of grammar, and the deaf writers capitalized on this by accelerating error correction performance. Since by comparison the error correction strategies of the hearing writers' was probably less dependent

on the availability of attention, their performance benefitted less under the Revising Other condition. It should be noted, however, that they too made significant improvements during Revising Other.

Discussion

The present findings do not dispute the earlier conclusions by Bartlett (1982) and Hull (1987) that certain kinds of errors are less detectable. Rather, these results propose an additional influence that may affect the detectability of all errors in first drafts to some degree. Even during a dedicated error search, the Language constraint faces considerable competition for the writer's attention. More precisely, when writers are inspecting their first drafts for errors, their Working Memories always encounter potential invasion by the meaning of their texts. The present findings do not verify with total certainty that the reduction of attention was caused by the intrusion of the writer's meaning. However, the research of Langer and Applebee (1986) and Newell (1985) identifies meaning as an extremely plausible candidate. These investigations found that the process of writing about a certain topic promotes the retrievability of that information--its ease of returning to Working Memory with a minimum of prompting. The information may even monopolize Working Memory against the writer's intentions. The virtual omnipresence of this threat to error detection has implications for the choices of strategies by both writers and their teachers.

Writers will benefit simply from the knowledge that they tend to overlook grammatical errors in their drafts. Thus informed, they can exert greater scrutiny of their texts, which may require more than a single

inspection. Knowledge that it is specifically meaning that encroaches on attention ought to prompt inspection routines that minimize the retrieval of the text's meaning, stored earlier in LTM. For example, instead of simply reading texts in their customary fashion, writers could strategically process the texts in stages, focusing first on correctness of the verbs, then nouns and adjectives, and later prepositions. This selective inspective process would retard the retrieval of meaning from LTM and preserve attention for error detection. Although this approach encourages writers to apply intentional metacognitive strategies to their error search processes, teachers energies might be better invested in the development of students' intuitive language competence.

The findings of this study suggest that explicit knowledge of grammar conventions is not completely at a writer's disposal during composing and editing. Even if a set of rules is accurate and complete, it may be somewhat inaccessible if application requires the writer's attention. The other composing constraints are competing for that limited amount of processing space in Working Memory. Teachers are thus encouraged to promote the kind of language competence that does not require excessive use of attention, namely the competence that Krashen refers to as "acquired."

Acquired competence is the intuitive, fluent competence that the language user has "picked up" through frequent opportunities to communicate. According to Krashen it does not result from formal instructions and error correction. The literature related to second language learning stresses the value of the communicative approach to language learning (see Brumfit & Johnson, 1979; Burling, 1982) as a way to augment acquired com-

petence. This approch to classroom instruction urges teachers to use activities and exercises that are valid acts of communication. Zamel (1983, p. 184), described and endorsed the communicative philosophy this way:

> The most recent approaches to language instruction have underlined the fact that language learning can best be promoted when language is used purposefully and communicatively, when language is viewed as the means for true expression, when language accuracy serves linguistic fluency and is subordinate to it.

Frank Smith (1984), long an advocate of an approach to reading instruction that is focused on meaning, also endorses the communicative philosophy for writing. He argues that if students are made to feel like writers, "members of the Writers Club" (p. 53), they will begin to read like writers. Students will pick up the nuances of written expression when, as "spontaneous apprentices," they read the texts of established writers. He warns, however, that "emphasis on the elimination of mistakes results in the elimination of writing" (p. 56).

Carroll (1986) emphasized that while communicative events may be necessary conditions for development of acquired competence, they are certainly not sufficient. He argued that in order for language acquisition to occur, the learner must "notice regularities" (p. 103) in the target language. The noticing need not be the result of explicit instruction. Carroll expressed it this way, "The process may be subconscious in the sense that the learner may not notice that he is noticing something, or not notice that what he is noticing is a regularity. The noticing of regularities seems, in any event, to be a minimal cognitive process necessary in acquiring [a second language]" (p. 103).

Carroll also suggests that the target regularity must be within the learner's current span of apprehension, it must occur in some particular context, it must occur on different occasions in highly similar contexts, and the regularity must be noticed in contrast with other regularities of the language. According to this line of reasoning, the greatest challenge to teachers is to arrange appropriate "patterns of noticing" by their students.

It seems like heresy to encourage writers to ignore their intended meanings, but at times they must in order to accomplish thorough and accurate corrections of grammatical errors. A well developed acquired language competence will minimize the need to block out meaning because fewer errors will be made and they will be detected with a minimal draw on attention; they just won't "sound right." However, writers who do rely heavily on learned competence will need to apply intentional strategies for protecting attention from the intrusion of meaning during the search for errors.

## References


Carroll, J. (1986). Second language. In R. Dillon and R. Sternberg (Eds.), Cognition and Instruction (pp. 83-125). New York: Academic Press.

Bartlett, E. (1982). Learning to revise: Some component processes. In M. Nystrand (Ed.), What writers know: The language process, and structure of written discourse (pp. 345-364). New York: Academic Press.

Brumfit, C. and Johnson, K. (Eds.) (1979). The communicative approach to language teaching. London: Oxford University Press.

Burling, R. (1982). Sounding right: An introduction to comprehension-based language instruction. Rowley, MA: Newburh House.

Charrow, V. (1974). Deaf English--An investigation of the written English competence of deaf adolescents. Unpublished doctoral dissertation, Stanford University.

Crandall, K. (1978). Reading and writing skills and the deaf adolescent. Volta Review, 80, 319-332.

Crandall, K. (1980). Written language scoring procedures for grammatical correctness according to reader intelligibility. Rochester, NY: National Technical Institute for the Deaf.

Flower, L. and Hayes, J. (1980). The dynamics of composing: Making plans and juggling constraints. In L. Gregg and E. Steinberg (Eds.), Cognitive processes in writing (pp. 31-50). Hillsdale, NJ: Lawrence Erlbaum.

Hull, G. (1987). The editing process in writing: A performance study of more skilled and less skilled college writers. Research in the Teaching of English, Vol. 21, No. 1, p. 8-29.

Krashen, S. D. (1978). Individual variation in use of the monitor. In W. C. Ritchie (Ed.), Second language acquisition research (pp. 175-184). New York: Academic Press.

Langer, J. and Applebee, A. (1986). Moving toward excellence: Writing and learning in the secondary school curriculum. (National Institute of Education Grant No. NIE-82-0027). Stanford, CA: Stanford University School of Education.

Meath-Lang, B., Caccamise, F., and Albertini, J. (1982). Deaf persons' views on English language learning: Education and sociolinguistic implications. In H. Hoemann and R. B. Wilbur (Eds.), Interpersonal communication and deaf people. Washington, D.C.: Gallaudet College.

Newell, G. (1984). Learning from writing in two content areas: A case study/protocol analysis. Research in the Teaching of English, Vol. 18, No. 3, 265-288.

Scardamalia, M. (1981). How children cope with the cognitive demands of writing. In C. Fredericksen and J. Dominic (Eds.), Writing: The nature, development, and teaching of written communication: Vol. 2. Process, development and communication (pp. 81-103). Hillsdale, NJ: Lawrence Erlbaum.

Smith, F. (1984). Reading like a writer. In J. M. Jensen (Ed.), Composing and comprehension (pp. 47-56). Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills and National Conference on Research in English.

Wilbur, R. B. (1977). An explanation of deaf children's difficulty with certain syntactic structures. Volta Review, 79 (2), 85-92.

Zamel, V. (1983). The composing process of advanced ESL students: Six case histories. TESOL Quarterly, 17, 165-187.

Appendix A

Application of Crandall Scoring
System to Two Sentences
from Student Passage

Sample #1 (Original): "He drink whiskey, after used gun his face but the gun won't work bullet."

Sample #1 (Corrected): He drink whiskey, after used gun his face but the gun won't work bullet.

Classified Errors

Type 9: Incorrect addition of comma after "whiskey".

Type 8: Omitted inflection of "drink"
Omitted indefinite article before "gun"

Type 7: (See Sample #2)

Type 6: Omitted preposition before "his face".

Type 5: Substitution of "used" for "held".

Type 4: Major constituent, "bullet", is placed in the wrong order.

---

Sample #2 (Original): He jumbed on boat as safety.

Sample #2 (Corrected): He jumbed on boat ~~as~~ safety.

Classified Errors

Type 9: Incorrect spelling of "jump".

Type 8: Omission of definite article.

Type 7: Incorrect suffix on "safe".

Type 6: Insertion of "as".